CLAIMS

1. An osteosynthetic aid for tubular bones, comprising a locking nail which has a shank with first and second ends and, at the two ends of said shank, has at least one cross-bore extending along a transverse axis and a headed locking screw for extending through said cross-bore and a biasing sleeve which resiliently deforms in an axial direction, for fixing disposed between a head of the locking screw and the shank.

2. The osteosynthetic aid as set forth in claim 1 wherein the sleeve has a radial flange at one end against which the head of the locking screw comes to bear.

3. The osteosynthetic aid as set forth in claim 2 wherein the locking screw has a threaded portion which interengages with a thread of a cross-bore.

4. The osteosynthetic aid as set forth in claim 1 wherein the locking screw is a tibial bolt which has a first head at one end and a second head at an opposite end onto which the tibial nut is adapted to be screwed and a first biasing sleeve is disposed between the head of the tibial bolt and the nail shank and a second biasing sleeve is disposed between the nail shank and the tibial nut.

5. A biasing element for use with a locking nail for applying an axial tension between a head of a locking screw or tibial bolt and a shank of the locking nail, comprising a sleeve having a series of axially spaced circumferential slots which are circumferentially offset from each other.

6. The biasing element as set forth in claim 5 wherein end portions of the circumferential slots overlap each other.

7. The biasing element as set forth in claim 6 wherein the circumferential slots extend through an angle of more than 180°.

8. The biasing element as set forth in claim 7 wherein the circumferential slots are disposed to be offset by about 90° from each other.

9. The biasing element as set forth in claim 5 wherein the sleeve has a radial annular flange at one end.

10. The biasing element as set forth in claim 9 wherein the annular flange has a chamfer on its side opposite the nail shank.

11. An apparatus for fixing a shank of an implant for a long bone in a direction transverse to an axis of the long bone, comprising:

a bone screw having a first portion including an end with a head and a second portion for insertion through a bore in said shank;

a first biasing element having a deformable wall surrounding a central opening for receiving the screw portion, said first screw head portion engaging a first end of said biasing element, said nail shank engaging a second end of said biasing element.

12. The apparatus as set forth in claim 11 wherein the biasing element is a sleeve having a series of axially spaced circumferentially extending slots which are circumferentially offset from one another.

13. The apparatus as set forth in claim 12 wherein end portions of the circumferential slots overlap one another.

14. The apparatus as set forth in claim 13 wherein the circumferential slots extend through an angle of more than 180°.

15. The apparatus as set forth in claim 14 wherein adjacent slots are offset by about 90° from one another.

16. The apparatus as set forth in claim 11 wherein said screw second portion is releasably coupled to said first portion, said second portion having an end opposite said end of said first portion having a head, said end including a head.

17. The apparatus as set forth in claim 16 further including a second biasing element having a first end for engaging the head of the second screw portion and an end engaging said nail shank.

18. The apparatus as set forth in claim 17 wherein the biasing element is a sleeve having a series of axially spaced circumferentially extending slots which are circumferentially offset from one another.

19. The apparatus as set forth in claim 18 wherein end portions of the circumferential slots overlap one another.

20. The apparatus as set forth in claim 19 wherein the circumferential slots extend through an angle of more than 180°.

21. The apparatus as set forth in claim 20 wherein adjacent slots are offset by about 90° from one another.

22. A method for fixing an implant shank in a long bone, the shank having an opening therein extending along an axis transverse to an axis of a long bone, comprising:

inserting said shank into the long bone;

aligning a biasing sleeve having a deformable walls extending between first and second ends thereof surrounding a central bore therein with the transverse opening in the shank;

inserting a bone screw having a first portion including an end with a head and a threaded second portion through said biasing sleeve and into said transverse opening in said shank;

compressing said biasing sleeve by deforming the walls thereof by tightening said bone screw so that the head thereof engages the first end of the biasing sleeve and the second end of said sleeve engages a first side of said shank.

23. The method as set forth in claim 22 wherein said compressing includes inserting said threaded screw second portion into a threaded nut aligned with said transverse shank opening on a second side of said shank opposite said first side.

24. The method as set forth in claim 23 further comprising inserting a second biasing sleeve between said nut and said second side of said shank and comprising said second biasing sleeve by tightening said bone screw.